

REMARKS/ARGUMENTS

Claim Objections

In the Office Action, Examiner objects to claims 1-19 for informalities. Applicants have amended claims 1, 10, 13, and 17 to correct the informalities. These amendments should not be construed to further limit the scope of these claims. Applicants respectfully request that the objection to claims 1-19 be withdrawn and the claims formally allowed at this time.

Claim Rejections under 35 U.S.C. §103

In the Office Action, Examiner rejects claims 1-7, 12, and 16-19 under 35 U.S.C. §103(a) as being unpatentable over US Patent 2,683,972 to Atkinson (hereafter Atkinson) in view of US Patent 3,259,145 to Engle (hereafter Engle). Examiner has failed to provide a prima facie basis for rejection under 35 U.S.C. § 103(a) because there is no teaching or suggestion in these references of the “liquefied and/or solidified condensables enriched fluid outlet” of the independent claims of the present application. Applicant has made this argument in the response mailed on January 8, 2008. In the office action mailed February 29, 2008, the Examiner indicates that he does not agree that this element is missing from the references. The Examiner, in paragraph 4 of the office action mailed February 29, 2008, indicates that the vortex tube 13 of Atkinson is the same as the primary gas cooling device of the present invention, and that the cooled gas outlet 14, is the same as the condensables enriched fluid outlet of the present invention. Applicant respectfully disagrees.

Applicant points to US patent 1,952,281, herein after Ranque, to explain how the vortex tube of Atkinson operates. Further, Ranque is the reference cited by Atkinson at column 2, lines 34-37, to describe what the vortex tube of his invention is. Further, Atkinson provides no other description of how a vortex tube works or what is meant by the element vortex tube, so Applicant must conclude

that the vortex tube described by Ranque is the vortex tube suggested by Atkinson.

The vortex tube of Ranque has a cold outlet, and a hot outlet. Orifice A is the exit for a stream of cold fluid, and orifice B is the exit for a current of hot fluid. The vortex tube operation is described as having the flow from an inlet pipe 7, which is referred to as flow sheet 11, spin around the outside of the tube until the flow, which is at this time, the total flow, reached a deflector 9, at which point, some fluids are allowed to exit the tube through orifice B as the remaining fluid, which is flow sheet 12, is forced to return through the center of the tube to exit the tube at orifice A in the opposite direction. The angular velocity of flow sheet 12 is not lost, and so the returning portion of the stream continues to circulate as it travels in the opposite direction. It is claimed by Ranque that the returning stream, flow sheet 12, exerts work on the total stream, flow sheet 11, and because of conservation of energy, the temperature of flow sheet 11 is increased at the expense of flow sheet 12, which cools. Flow sheet 12 consists of a portion of flow sheet 12, and there is no indication that the compositions of the streams are any different.

Because flow stream 12 is heated in the vortex tube, it would not be expected that condensables that are in the vapor phase in the inlet would be condensed at the higher temperatures of the hot outlet. Even if condensables are condensed in the cool stream, flow sheet 11, the total stream exits and the condensables in this stream are not separated, thus there is no enrichment of the condensables in flow stream 11. Further, anything that would possibly condense or solidify from the flow going through the vortex tube, because of the spinning action, would clearly be at the outer circumference by the end of the vortex tube, it would be the first fluid to exit the vortex tube with the hot stream through orifice B. The hot outlet of the vortex tube of Atkinson, 17, clearly does not read on the condensables enriched fluid outlet of the present invention because the hot outlet fluids of Atkinson is used as a heat source to melt hydrates in the separation

chamber 10, and is not induced to swirl around the central axis of the tubular section of a secondary fluids separation vessel as is the liquefied and/or solidified condensables enriched fluid of the present invention.

The workings of a vortex tube found under "Vortex Tube" in Wikipedia is consistent with the description provided by Ranque.

Thus, Applicant remains of the position that the element of the "liquefied and/or solidified condensables enriched fluid outlet" of the independent claims of the present application is not taught or suggested by neither Atkinson nor Engle. A prima facie basis for the rejection under 35 U.S.C. §103(a) is therefore not presented, and this rejection is respectfully traversed.

Dependent claims 2-7, 12 and 16-19 depend from either claim 1 or claim 17 and include all the limitations of the independent claims. Thus, Applicants respectfully request that the rejection of claims 1-7, 12, and 16-19 under 35 U.S.C. §103(a) be withdrawn and the claims formally allowed at this time.

Conclusion

Applicants have addressed each and every objection and ground for rejection. The amended claims are patentable over the cited art and Applicants request that the application be allowed. In the event the Examiner has any questions or there are any issues with respect to the application, the Examiner is invited to call the undersigned at the telephone number below prior to the issuance of any written action.

Respectfully submitted,
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